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| APPROVED BY<br>U.S. COAST GUARD<br><i>Michael M... ..</i><br>DATE <u>8/4/84</u> | APPROVED BY<br>BUREAU OF EXPLOSIVES<br><i>E. P. R... ..</i><br>SUPERVISOR, MILITARY & INTERMODAL SERVICES<br>DATE <u>7/6/84</u> |
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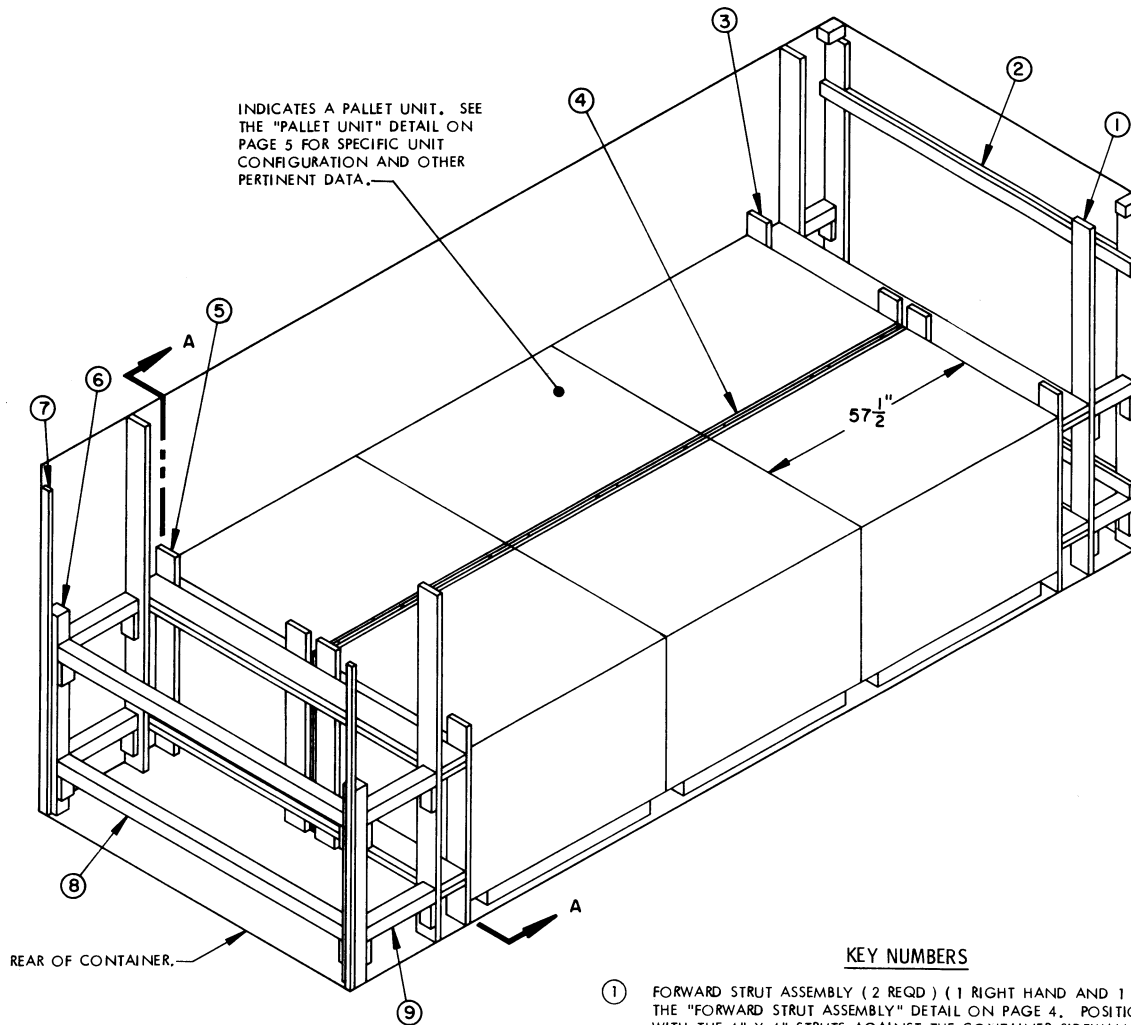
# LOADING AND BRACING<sup>1</sup> WITH WOODEN DUNNAGE IN COMMERCIAL CONTAINERS OF FLARE, AIRCRAFT PARACHUTE, MK 45 MOD 0

① LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS. SEE GENERAL NOTE "K" ON PAGE 3.

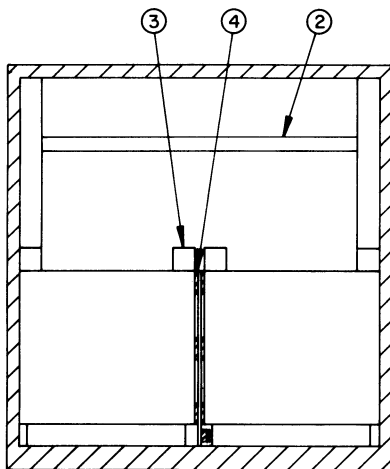
| <u>ITEM</u>                                      | <u>PAGE(S)</u> |
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| REVISIONS  |       |          |         | DRAFTSMAN       | PROJ. ENG.                          |
|--|-------|----------|---------|-----------------|-------------------------------------|
|  |       |          |         | <i>ABK</i> / bh | <i>WRF/WRF</i>                      |
|  |       |          |         | <i>GKE</i>      | LOG ENGINE OFFICE<br><i>WRF/WRF</i> |
| APPROVED, U. S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND<br><i>B. J. ... ..</i>   |       |          |         |                 |                                     |
| APPROVED BY ORDER OF COMMANDING GENERAL, U. S. ARMY MATERIEL COMMAND (AMC)<br><i>John L. ... ..</i><br>U. S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL |       |          |         |                 |                                     |
| U. S. ARMY AMC DRAWING   |       |          |         |                 |                                     |
| AUGUST 1984  |       |          |         |                 |                                     |
|  | CLASS | DIVISION | DRAWING | FILE            |                                     |
|  | 19    | 48       | 4197    | 15PK<br>1000    |                                     |

**DO NOT SCALE**



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① FORWARD STRUT ASSEMBLY (2 REQD) (1 RIGHT HAND AND 1 LEFT HAND). SEE THE "FORWARD STRUT ASSEMBLY" DETAIL ON PAGE 4. POSITION THE ASSEMBLY WITH THE 4" X 4" STRUTS AGAINST THE CONTAINER SIDEWALL, AS SHOWN ABOVE. AFTER PIECE MARKED ③ IS INSTALLED AND CENTERED ON THE WIDTH OF THE CONTAINER, NAIL THROUGH THE REAR BUFFER PIECE OF EACH FORWARD STRUT ASSEMBLY INTO EACH BEAM ASSEMBLY OF PIECE MARKED ③ W/2-12d NAILS AT EACH JOINT.
- ② SPREADER ASSEMBLY (2 REQD). SEE THE "SPREADER ASSEMBLY" DETAIL ON PAGE 5. POSITION AS SHOWN ABOVE TOP AND BOTTOM ABOVE STRUTS AND NAIL TO THE FORWARD STRUT ASSEMBLY W/2-10d NAILS AT EACH JOINT.
- ③ FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY" DETAIL ON PAGE 4 AND GENERAL NOTE "F" ON PAGE 3.
- ④ CENTER FILL ASSEMBLY (3 REQD). SEE THE "CENTER FILL ASSEMBLY" DETAIL ON PAGE 4 AND GENERAL NOTES "D" AND "F" ON PAGE 3.
- ⑤ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY" DETAIL ON PAGE 5 AND GENERAL NOTE "F" ON PAGE 3.
- ⑥ DOOR POST VERTICAL (2 REQD). SEE THE "DOOR POST VERTICAL" DETAIL AND "DETAIL A" ON PAGE 7.
- ⑦ DOOR POST VERTICAL RETAINER (2 REQD). SEE THE "DOOR POST VERTICAL RETAINER" DETAIL ON PAGE 6 AND "DETAIL A" ON PAGE 7. NAIL THROUGH THE HOLES INTO THE DOOR POST VERTICAL W/2-10d NAILS.
- ⑧ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (2 REQD). TOENAIL TO THE 4" X 4" DOOR POST VERTICAL PIECES W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 7. AFTER INSTALLING THE DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑨, ARE TO BE INSTALLED.
- ⑨ STRUT, 4" X 4" BY CUT-TO-FIT (4 REQD). TOENAIL TO THE BUFFER PIECES OF THE "REAR BLOCKING ASSEMBLY" AND THE "DOOR POST VERTICAL" W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT DETAIL" ON PAGE 7.

( GENERAL NOTES CONTINUED )

- M. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
1. PREFABRICATE TWO FORWARD STRUT ASSEMBLIES, ONE FORWARD BLOCKING ASSEMBLY, TWO SPREADER ASSEMBLIES, THREE CENTER FILL ASSEMBLIES, ONE REAR BLOCKING ASSEMBLY, AND NAIL A DOOR POST VERTICAL RETAINER TO EACH DOOR POST VERTICAL, ONE RIGHT HAND AND ONE LEFT HAND.
  2. INSTALL FORWARD STRUT ASSEMBLIES, FORWARD BLOCKING ASSEMBLY, AND SPREADER ASSEMBLIES.
  3. LOAD ONE PALLET UNIT, INSTALL ONE CENTER FILL ASSEMBLY, AND LOAD ONE MORE PALLET UNIT.
  4. REPEAT STEP 3.
  5. REPEAT STEP 3.
  6. INSTALL REAR BLOCKING ASSEMBLY.
  7. INSTALL THE TWO DOOR POST VERTICAL ASSEMBLIES ( ONE RIGHT HAND AND ONE LEFT HAND ).
  8. INSTALL THE TWO DOOR SPANNER PIECES.
  9. INSTALL THE STRUTS BETWEEN THE REAR BLOCKING ASSEMBLY AND THE DOOR POST VERTICALS.
- N. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AK 740-1, AND AUGMENTS TM 743-200-1 ( CHAPTER 5 )
- B. THE SPECIFIED OUTLOADING PROCEDURE IS APPLICABLE TO A LOAD OF 6 PALLET UNITS OF FLAKE, AIRCRAFT PARACHUTE, MK 45 MOD O. SUBSEQUENT REFERENCE TO PALLET UNIT MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 5 FOR THE DETAIL OF THE PALLET UNIT. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF 44,800 POUNDS MUST NOT BE EXCEEDED.
- C. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8' HIGH INTERMODAL COMMERCIAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 89" HIGH. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT-CAR ( T/COFC ) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN BE USED.
- D. WHEN LOADING PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD ( TIGHT AGAINST THE FORWARD BLOCKING ASSEMBLY AND CONTAINER SIDEWALL ). ALTHOUGH A TOTAL OF ONE AND ONE-HALF INCHES ( 1-1/2" ) OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE HORIZONTAL PIECES ON ONE OR BOTH SIDES OF THE CENTER FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE LONGITUDINAL PIECES W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE NUMBER AND THICKNESS OF THE HORIZONTAL AND VERTICAL PIECES MAY BE ADJUSTED AS REQUIRED TO FACILITATE VARIANCE IN THE LENGTH OF THE PALLET UNIT.
- E. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- F. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- G. IN SOME CONTAINERS, SUCH AS SOME ALL STEEL CONTAINERS, THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. A PIECE OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THE 2" X 6" BUFFER PIECES. A PIECE OF 2" X 4", 2" X 3", OR A SPECIAL WIDTH PIECE CUT-TO-FIT CAN BE USED. THIS FILL PIECE WILL BE NAILED WITH ONE APPROPRIATELY SIZED NAIL EVERY 12". THIS PIECE IS NOT REQUIRED WHEN THE FRONT WALL OF THE CONTAINER IS SMOOTH AND FLAT.
- H. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR. ALL NAILING WILL BE WITHIN THE DUNNAGE.
- J. PORTIONS OF THE CONTAINERS DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- K. REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR ( T/COFC ). SPECIAL T/COFC NOTES FOLLOW:
1. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE.
  2. THE LOAD LIMIT OF A T/COFC RAIL CAR MUST NOT BE EXCEEDED, NOR WILL A CAR BE LOADED SO THAT THE TRUCK UNDER ONE END OF THE CAR CARRIES MORE THAN ONE-HALF OF THE LOAD LIMIT FOR THAT CAR.
- L. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS/MODIFIED FLAT BED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.

BILL OF MATERIAL

| LUMBER   | LINEAR FEET | BOARD FEET |
|--|-------------|------------|
| 1" X 4"  | 15          | 5          |
| 1" X 6"  | 120         | 60         |
| 2" X 4"  | 53          | 36         |
| 2" X 6"  | 78          | 78         |
| 2" X 8"  | 61          | 81         |
| 4" X 4"  | 35          | 47         |
| NAILS  | NO. REQD    | POUNDS     |
| 6d ( 2" )                                      | 207         | 1-1/4      |
| 10d ( 3" )                                     | 186         | 3          |
| 12d ( 3-1/4" )                                 | 32          | 3/4        |
| DOOR POST VERTICAL RETAINER ----- 2 REQD ----- |             | 64 LBS     |

( CONTINUED AT LEFT )

MATERIAL SPECIFICATIONS

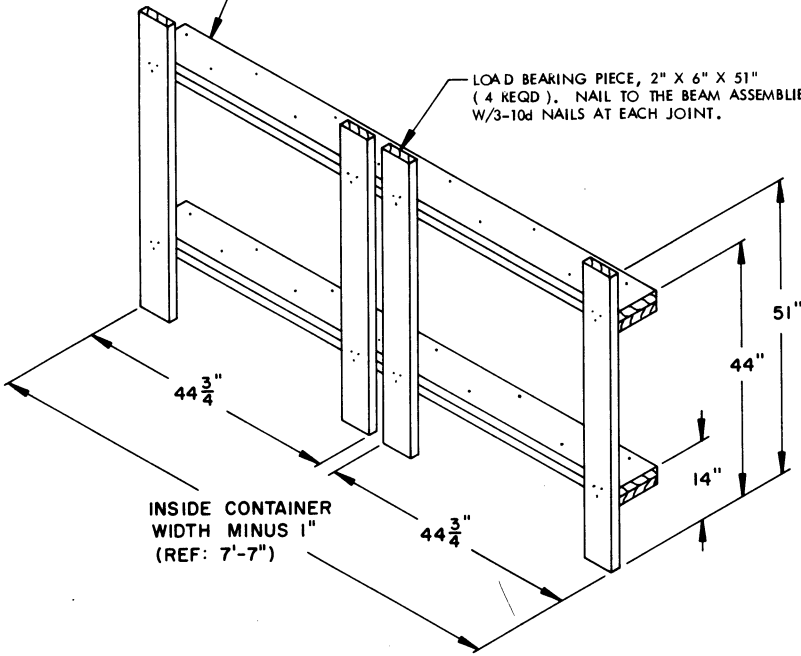
- LUMBER ----- : TM 743-200-1 ( DUNNAGE LUMBER ) AND FED SPEC MM-L-751.
- NAILS ----- : FED SPEC FF-N-105; COMMON.
- STEEL, STRUCTURAL ----- : FED SPEC QQ-S-741; SQUARE STRUCTURAL TUBING AND HOT-ROLLED STRIP.

LOAD AS SHOWN

| ITEM               | QUANTITY | WEIGHT ( APPROX ) |
|--------------------|----------|-------------------|
| PALLET UNIT -----  | 6 -----  | 9,348 LBS         |
| DUNNAGE -----      | -----    | 683 LBS           |
| CONTAINER -----    | -----    | 4,700 LBS         |
| TOTAL WEIGHT ----- |          | 14,731 LBS        |

BEAM ASSEMBLY, 2" X 8" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7") (DOUBLED) (2 REQD). LAMINATE W/11-10d NAILS.

LOAD BEARING PIECE, 2" X 6" X 51" (4 REQD). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.



**FORWARD BLOCKING ASSEMBLY**

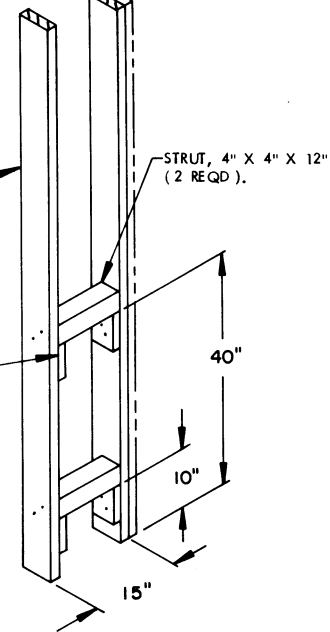
FORWARD BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-1-1/2") (1 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

SEE GENERAL NOTE "G" ON PAGE 3.

REAR BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" (REF: 7'-4-1/2") (1 REQD). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

STRUT, 4" X 4" X 12" (2 REQD).

STRUT LEDGER, 2" X 4" X 6" (4 REQD). NAIL TO THE BUFFER PIECE W/2-10d NAILS.

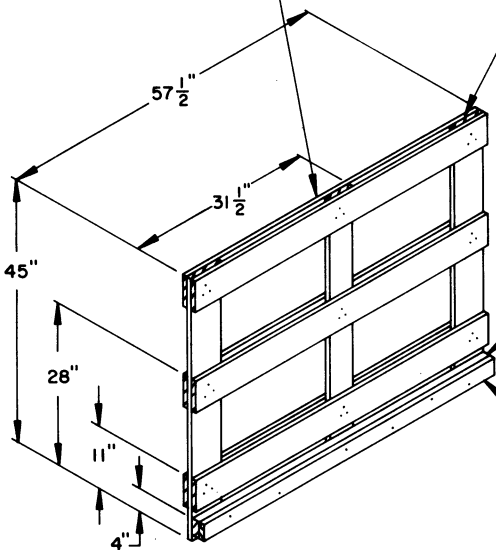


**FORWARD STRUT ASSEMBLY**

A "RIGHT HAND" FORWARD STRUT ASSEMBLY IS DEPICTED. A "LEFT HAND" ASSEMBLY IS ALSO REQUIRED AND WILL BE THE SAME AS THE ASSEMBLY DEPICTED ABOVE, EXCEPT THE 4" X 4" STRUTS AND STRUT LEDGERS ARE ALIGNED ON THE OPPOSITE SIDE OF THE BUFFER PIECES.

HORIZONTAL PIECE, 1" X 6" X 57-1/2" (6 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH JOINT.

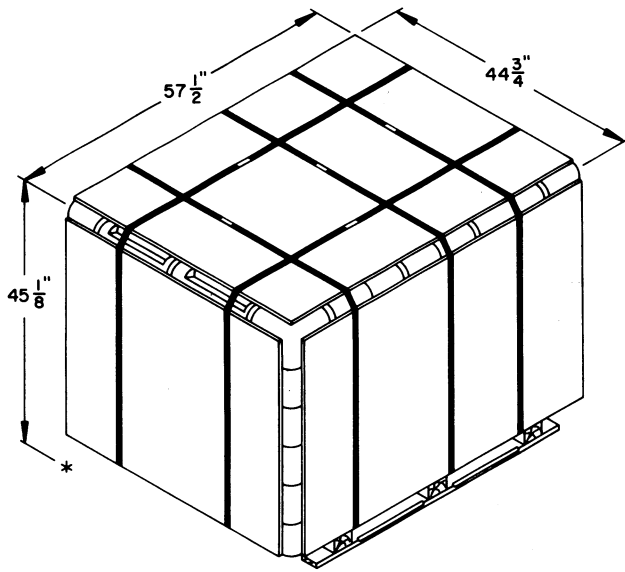
VERTICAL PIECE, 1" X 6" X 45" (3 REQD). NAIL TO FILL PIECE W/3-6d NAILS AT EACH JOINT.



**CENTER FILL ASSEMBLY**

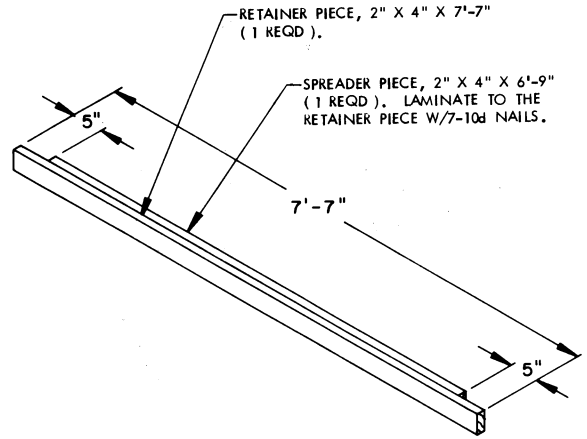
FILL PIECE, 2" X 4" X 57-1/2" (1 REQD).

HOLD DOWN PIECE, 1" X 4" X 57-1/2" (1 REQD). NAIL TO THE FILL PIECE W/6-6d NAILS.

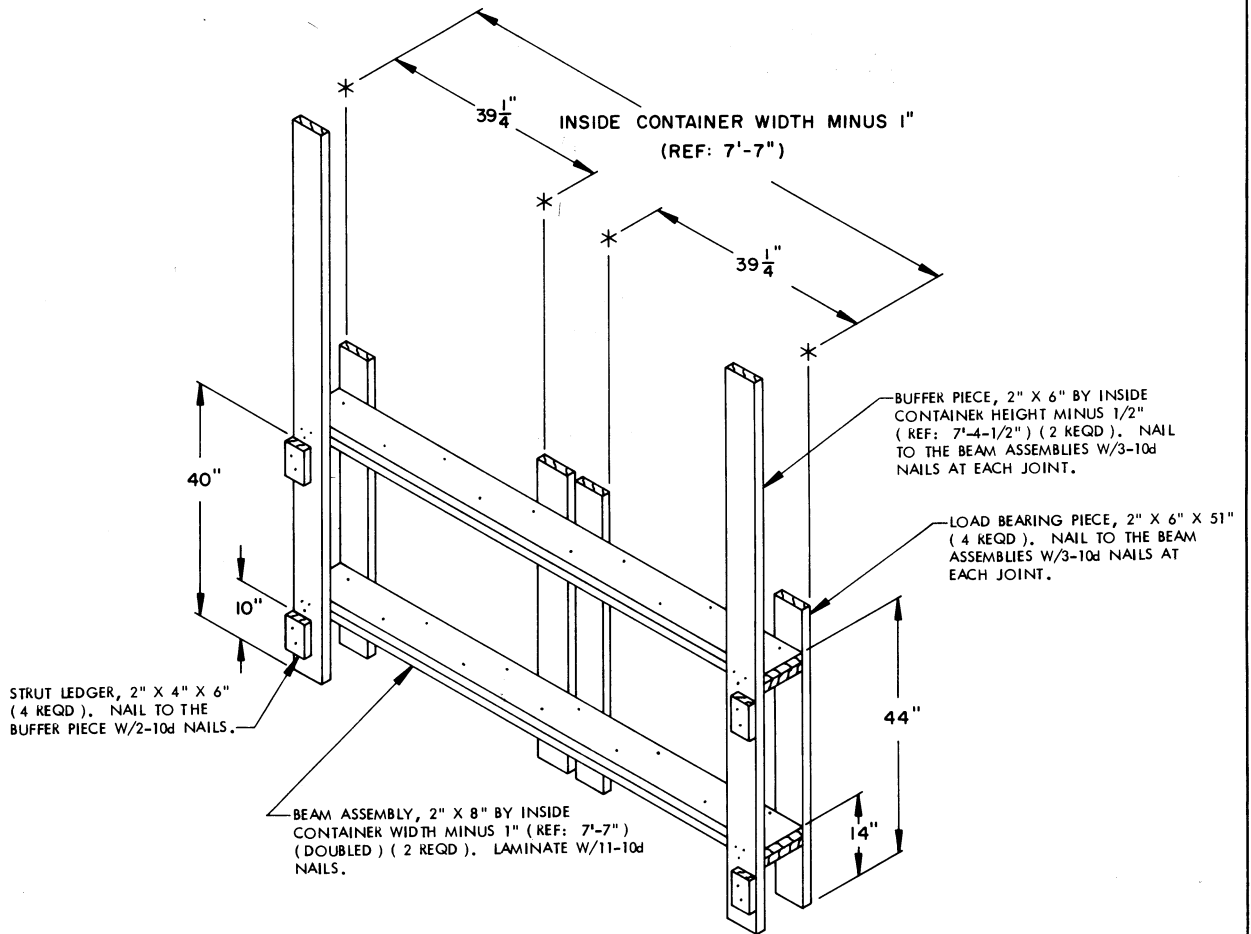


**PALLET UNIT**

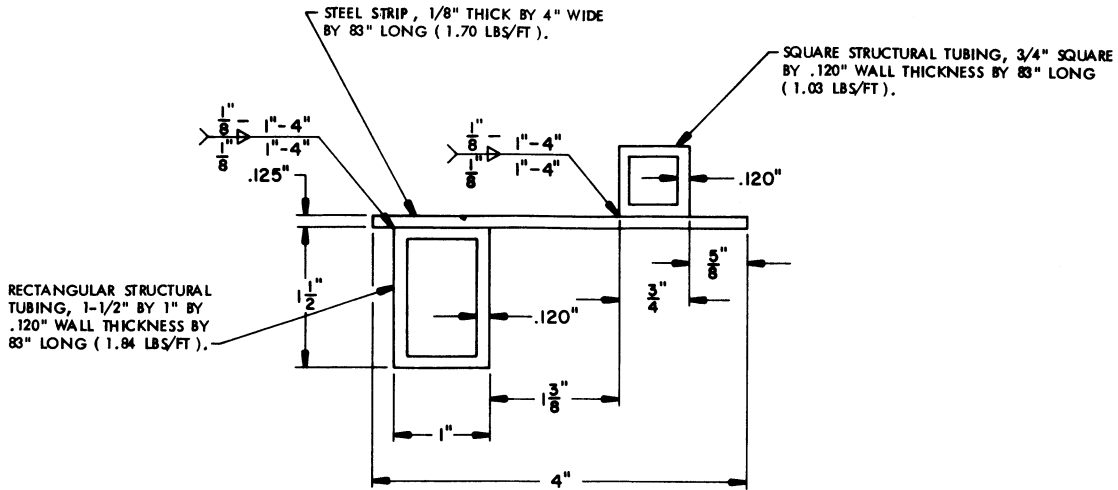
UNIT WEIGHT ----- 1,558 LBS (APPROX)  
 CUBE ----- 67.2 CU FT



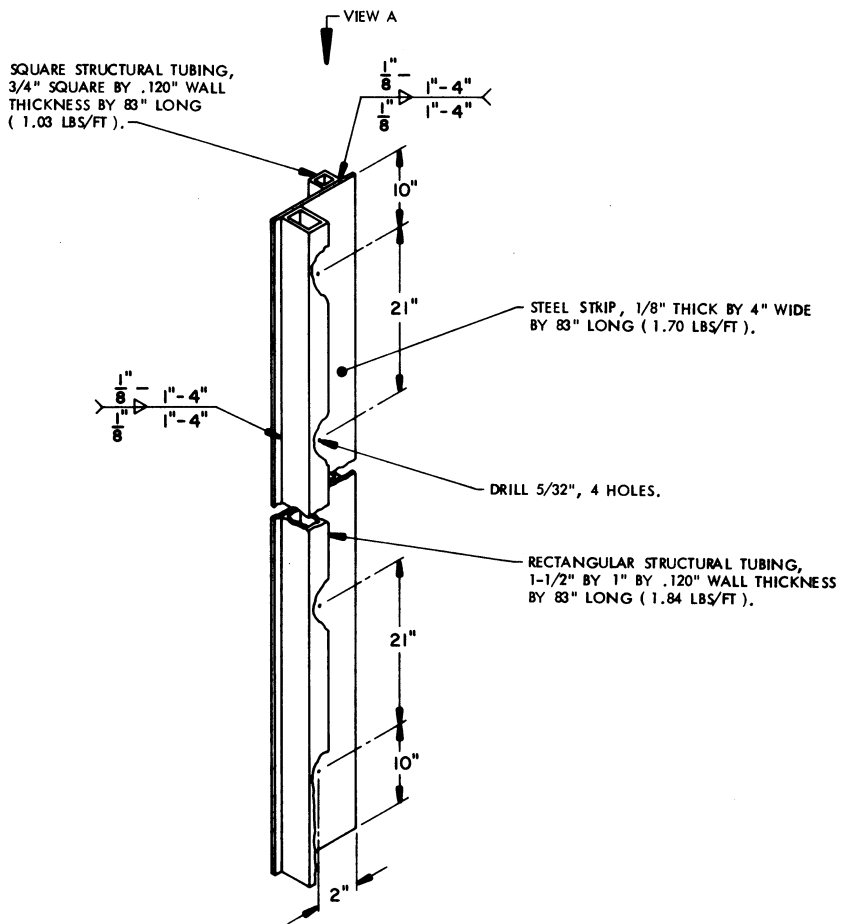
**SPREADER ASSEMBLY**



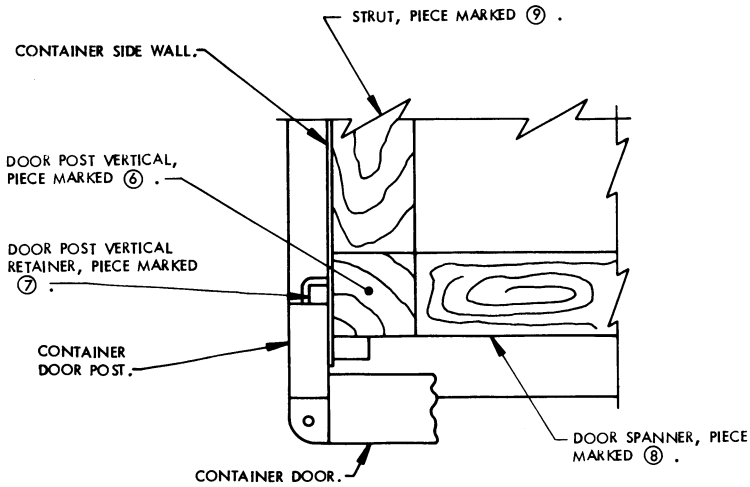
**REAR BLOCKING ASSEMBLY**



VIEW A

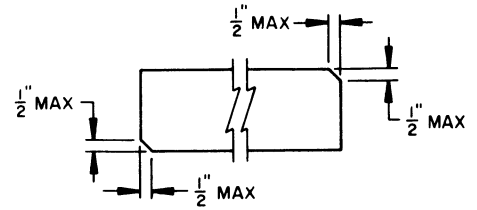


DOOR POST VERTICAL RETAINER



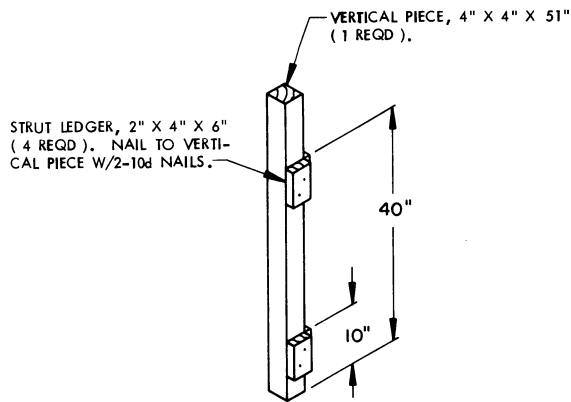
**DETAIL A**

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL AND ADJACENT DUNNAGE PIECES.



**BEVEL-CUT**

IF DESIRED, EACH END OF A DOOR SPANNER PIECE OR A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT DOOR-POST-TO-DOOR-POST FIT OR A TIGHT REAR-OF-LOAD FIT.



**DOOR POST VERTICAL**

